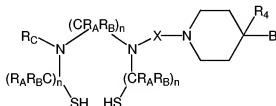


AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. - 15. (Cancelled)

16. (Previously presented) A compound according to the formula:



wherein:

B is selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, hydroxy, optionally substituted alkoxy, optionally substituted alkoxyalkyl, optionally substituted amino, optionally substituted mono and dialkyl amino, halogen, optionally substituted aryl, optionally substituted aralkyl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, optionally substituted heteroaralkyl, optionally substituted heteroaryl, and -X-Y;

R₄ is hydrogen, hydroxy, halogen, optionally substituted alkyl groups having from 1 to about 6 carbon atoms, optionally substituted alkoxy groups having from 1 to about 6 carbon atoms, or

R₄ and B taken in combination form an optionally substituted heterocyclic group having 5 or 12 ring atoms and one or two N, O, or S atoms and 1 or 2 fused rings;

R_A is independently chosen at each occurrence of R_A from the group consisting of hydrogen, lower alkyl having 1 to about 4 carbon atoms, alkyl ester groups having about 2 to about 8 carbon atoms, aryl ester groups having about 7 to about 18 carbon atoms, alkyl

amide groups having about 2 to about 8 carbon atoms, aryl amide groups having about 7 to about 18 carbon atoms, di(alkyl)aminoalkyl groups where each alkyl group has 1 to about 4 carbon atoms, and $-XNR_1R_2$;

R_B is hydrogen or lower alkyl having from 1 to about 4 carbon atoms for each occurrence of R_B ; or

$-(CR_A R_B)-$ taken in combination is $-(C=O)-$ such that there are zero or one $-(C=O)-$ groups;

R_C is selected from the group consisting of hydrogen, lower alkyl groups having 1 to about 8 carbon atoms, alkoxyalkyl group having from 2 to about 8 carbon atoms, alkyl ester or aryl ester groups having about 2 to about 8 carbon atoms, alkyl amide or aryl amide groups having about 2 to 8 carbon atoms, di(alkyl)aminoalkyl groups where each alkyl group has 1 to about 4 carbon atoms, and $-XNR_1R_2$;

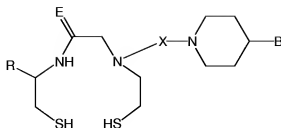
Y is a group capable of chelating to at least one metal ion;

X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain ;

R_1 and R_2 each are independently selected unsubstituted alkyl groups having from 1 to about 8 carbon atoms, alkoxyalkyl group having from 2 to about 8 carbon atoms, and substituted alkyl or alkoxyalkyl groups having from 1 to about 8 carbon atoms which are substituted with one or more groups selected from optionally substituted aryl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, and optionally substituted heteroaryl; and

n is either 2 or 3 and is independently chosen at each occurrence of n.

17. (Original) The compound of claim 16, the compound according to the formula:



wherein:

B is selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, hydroxy, optionally substituted alkoxy, optionally substituted alkoxyalkyl, optionally substituted amino, optionally substituted mono and dialkyl amino, halogen, optionally substituted aryl, optionally substituted aralkyl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, optionally substituted heteroaralkyl, optionally substituted heteroaryl, and -X-Y;

Y is a group capable of chelating to at least one metal ion;

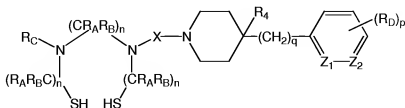
R is selected from hydrogen, C(O)O(R₃), or C(O)NH(R₃);

R₃ represents hydrogen, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted aralkyl, and optionally substituted cycloalkyl;

E represents an oxo group or two hydrogen atoms; and

X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain.

18. (Original) A compound capable of binding a metal ion, the compound according to the formula:



wherein:

R_D is independently selected at each occurrence from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, hydroxy, amino, halogen, cyano, nitro, optionally substituted alkoxy, optionally substituted alkoxyalkyl, optionally substituted mono and dialkyl amino, optionally substituted aryl, optionally substituted heteroaryl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic groups;

R_4 is hydrogen, hydroxy, halogen, optionally substituted alkyl groups having from 1 to about 6 carbon atoms, optionally substituted alkoxy groups having from 1 to about 6 carbon atoms, or

Z_1 and Z_2 are independently selected from CH, CR_D , and N;

p is selected from integers between about 0 and about 5;

q is selected from integers between about 0 and about 10;

R_A is independently chosen at each occurrence of R_A from the group consisting of hydrogen, lower alkyl having 1 to about 4 carbon atoms, alkyl ester groups having about 2 to about 8 carbon atoms, aryl ester groups having about 7 to about 18 carbon atoms, alkyl amide groups having about 2 to about 8 carbon atoms, aryl amide groups having about 7 to about 18 carbon atoms, di(alkyl)aminoalkyl groups where each alkyl group has 1 to about 4 carbon atoms, and $-XNR_1R_2$;

R_B is hydrogen or lower alkyl having from about 1 to about 4 carbon atoms for each occurrence of R_B ; or

$-(CR_AR_B)-$ taken in combination is $-(C=O)-$ such that there are zero or one $-(C=O)-$ groups;

R_C is selected from the group consisting of hydrogen, lower alkyl groups having 1 to about 8 carbon atoms, alkoxyalkyl groups having from 2 to 8 carbon atoms, alkyl ester or aryl ester groups having about 2 to about 8 carbon atoms, alkyl amide or aryl amide groups having about 2 to 8 carbon atoms, di(alkyl)aminoalkyl groups where each alkyl group has 1 to about 4 carbon atoms, and $-XNR_1R_2$;

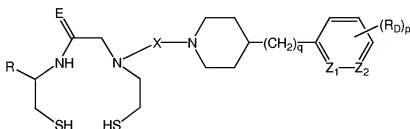
Y is a group capable of chelating to at least one metal ion;

X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain ;

R₁ and R₂ each are independently selected unsubstituted alkyl groups having from 1 to about 8 carbon atoms, alkoxyalkyl group having from 2 to about 8 carbon atoms, and substituted alkyl or alkoxyalkyl groups having from 1 to about 8 carbon atoms which are substituted with one or more groups selected from optionally substituted aryl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, and optionally substituted heteroaryl; and

n is either 2 or 3 and is independently chosen at each occurrence of n.

19. (Original) The compound of claim 18, the compound according to the formula:



wherein:

R_D is independently selected at each occurrence from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, hydroxy, amino, halogen, cyano, nitro, optionally substituted alkoxy, optionally substituted alkoxyalkyl, optionally substituted mono and dialkyl amino, optionally substituted aryl, optionally substituted heteroaryl, optionally substituted cycloalkyl, and optionally substituted heteroalicyclic groups;

Z₁ and Z₂ are independently selected from CH, CR_D, and N;

p is selected from integers between about 0 and about 5;

q is selected from integers between about 0 and about 10;

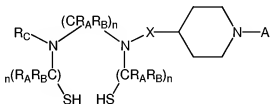
R is selected from hydrogen, $C(O)O(R_3)$, or $C(O)NH(R_3)$;

R_3 represents hydrogen, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted aralkyl, and optionally substituted cycloalkyl;

E represents an oxo group or two hydrogen atoms; and

X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain.

20. (Original) A compound capable of binding a metal ion, the compound according to the formula:



wherein:

A is selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted aralkyl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, optionally substituted heteroaralkyl, optionally substituted heteroaryl, and -X-Y;

R_A is independently chosen at each occurrence of R_A from the group consisting of hydrogen, lower alkyl having 1 to about 4 carbon atoms, alkyl ester groups having about 2 to about 8 carbon atoms, aryl ester groups having about 7 to about 18 carbon atoms, alkyl amide groups having about 2 to about 8 carbon atoms, aryl amide groups having about 7 to about 18 carbon atoms, di(alkyl)aminoalkyl groups where each alkyl group has 1 to about 4 carbon atoms, and $-XNR_1R_2$;

R_B is hydrogen or lower alkyl having from about 1 to about 4 carbon atoms for each occurrence of R_B ; or

$-(CR_A R_B)-$ taken in combination is $-(C=O)-$ such that there are zero or one $-(C=O)-$ groups;

R_C is selected from the group consisting of hydrogen, lower alkyl groups having 1 to about 8 carbon atoms, alkoxyalkyl groups having from 2 to 8 carbon atoms, alkyl ester or aryl ester groups having about 2 to about 8 carbon atoms, alkyl amide or aryl amide groups having about 2 to 8 carbon atoms, di(alkyl)aminoalkyl groups where each alkyl group has 1 to about 4 carbon atoms, and $-XNR_1R_2$;

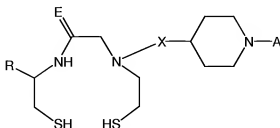
Y is a group capable of chelating to at least one metal ion;

X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain ;

R_1 and R_2 each are independently selected unsubstituted alkyl groups having from 1 to about 8 carbon atoms, alkoxyalkyl group having from 2 to about 8 carbon atoms, and substituted alkyl or alkoxyalkyl groups having from 1 to about 8 carbon atoms which are substituted with one or more groups selected from optionally substituted aryl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, and optionally substituted heteroaryl; and

n is either 2 or 3 and is independently chosen at each occurrence of n.

21. (Original) The compound of claim 20, the compound according to the formula:



wherein:

A is selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted aralkyl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, optionally substituted heteroaralkyl, optionally substituted heteroaryl, and -X-Y;

R is selected from hydrogen, C(O)O(R₃), or C(O)NH(R₃);

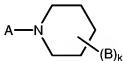
R₃ represents hydrogen, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted aralkyl, and optionally substituted cycloalkyl;

E represents an oxo group or two hydrogen atoms; and

X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain.

22. - 23. (Cancelled)

24. (Previously presented) A neutral or cationic complex comprising a metal ion and a compound according to the formula:



wherein

A is selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted aralkyl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, optionally substituted heteroaralkyl, optionally substituted heteroaryl, and -X-Y;

B is independently selected at each occurrence of B from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, hydroxy, optionally substituted alkoxy, halogen, hydroxy, optionally substituted alkoxyalkyl,

optionally substituted amino, optionally substituted mono and dialkyl amino, optionally substituted aryl, optionally substituted aralkyl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, optionally substituted heteroaralkyl, optionally substituted heteroaryl, and -X-Y;

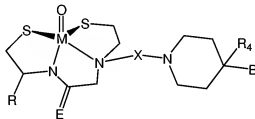
X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain;

k is an integer from about 1 to about 3; and

Y is a group capable of chelating to at least one metal ion,
wherein at least one of A or B is chosen to be -X-Y.

25. - 28. (Cancelled)

29. (Original) The complex of claim 24, wherein the complex is of the formula:



wherein

M is one or more isotopes of technetium or rhenium;

B is selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, hydroxy, optionally substituted alkoxy, optionally substituted alkoxyalkyl, optionally substituted amino, optionally substituted mono and dialkyl amino, halogen, optionally substituted aryl, optionally substituted aralkyl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, optionally substituted heteroaralkyl, optionally substituted heteroaryl, and -X-Y;

R₄ is hydrogen, hydroxy, halogen, optionally substituted alkyl groups having from 1 to about 6 carbon atoms, optionally substituted alkoxy groups having from 1 to about 6 carbon atoms, or

R₄ and B taken in combination form an optionally substituted heterocyclic group having 5 or 12 ring atoms and one or two N, O, or S atoms and 1 or 2 fused rings;

Y is a group capable of chelating to at least one metal ion;

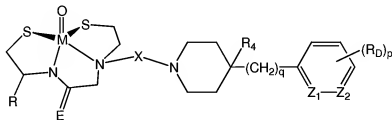
R is selected from hydrogen, C(O)O(R₃), or C(O)NH(R₃);

R₃ represents hydrogen, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted aralkyl, and optionally substituted cycloalkyl;

E represents an oxo group or two hydrogen atoms; and

X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain.

30. (Previously presented) A complex of claim 29, wherein the complex is of the formula:



wherein:

M is one or more isotopes of technetium or rhenium;

R_D is independently selected at each occurrence from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, hydroxy, amino, halogen, cyano, nitro, optionally substituted alkoxy, optionally substituted alkoxyalkyl, optionally substituted mono and dialkyl amino, optionally substituted aryl,

optionally substituted heteroaryl, optionally substituted cycloalkyl, and optionally substituted heteroalicyclic groups;

R_4 is hydrogen, hydroxy, halogen, optionally substituted alkyl groups having from 1 to about 6 carbon atoms, optionally substituted alkoxy groups having from 1 to about 6 carbon atoms;

Z_1 and Z_2 are independently selected from CH, CR_D , and N;

p is selected from integers between about 0 and about 5;

q is selected from integers between about 0 and about 10;

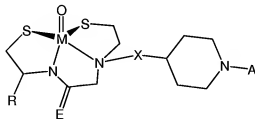
R is selected from hydrogen, $C(O)O(R_3)$, or $C(O)NH(R_3)$;

R_3 represents hydrogen, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted aralkyl, and optionally substituted cycloalkyl;

E represents an oxo group or two hydrogen atoms; and

X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain .

31. (Previously presented) A complex of claim 29, wherein the complex is of the formula:



wherein:

M is one or more isotopes of technetium or rhenium;

A is selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally

substituted aralkyl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, optionally substituted heteroaralkyl, optionally substituted heteroaryl, and -X-Y;

R is selected from hydrogen, C(O)O(R₃), or C(O)NH(R₃);

R₃ represents hydrogen, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted aralkyl, and optionally substituted cycloalkyl;

E represents an oxo group or two hydrogen atoms; and

X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain.

32. (Previously presented) The complex of claim 24, wherein the metal ion is radiolabelled or radioactive.

33. - 35. (Cancelled)

36. (Previously presented) A method for in-vivo or in-vitro imaging of at least one tumor comprising the steps of:

providing a radiolabeled metal complex of any one of claims 29 through 31, wherein ;
contacting the tumor(s) with the radiolabeled metal complex; and
making a radiographic image to visualize the tumor(s).

37. - 39. (Cancelled)

40. (Original) The method of claim 36, wherein the tumor(s) are neoplasm(s).

41. (Original) The method of claim 36, wherein the tumor(s) are carcinoma(s).

42. (Original) The method of claim 36, wherein the tumor(s) are melanoma(s).

43. (Original) The method of claim 36, wherein the tumor(s) are prostate carcinoma, breast carcinoma, lung carcinoma, renal carcinoma, colon carcinoma, glioblastoma, neuroblastoma, sarcoma, or a combination thereof.

44. - 45. (Cancelled)

46. (Previously presented) A method for in-vivo or in-vitro imaging of at least one tissue expressing one or more proteins or receptors for which radiolabeled complexes have affinity, the method comprising the steps of:

providing a radiolabeled metal complex of claim 24;

contacting the tissue(s) expressing the receptors with the radiolabeled metal complex; and

making a radiographic image to visualize the tissue(s).

47. (Original) The method of claim 46, wherein the proteins or receptors selected from serotonin receptors, adrenergic receptors, adrenoceptors receptors, dopamine receptors, sigma receptors, emopamil binding proteins, calcium channel receptors, or any subtype or subclass thereof.

48. (Original) The method of claim 46, wherein the protein or receptor expressed by the tissue to be imaged are selected from 5HT_{1A}, σ_1 , σ_2 , α_1 , Ca⁺² channel receptors, EBP or a combination thereof.

49. - 53. (Cancelled)

54. (Previously presented) A method for the treatment of cancer comprising the steps of:

providing a cytotoxic metal complex according to claim 24; and
contacting the tumor(s) with the cytotoxic metal complex.

55. - 62. (Cancelled)

63. (Previously presented) A method of inhibiting a protein or receptor comprising the steps of:

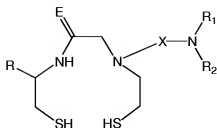
providing a metal complex according to claim 24; and
contacting the tumor(s) with the metal complex.

64. (Original) The method of claim 63, the protein or receptor are selected from serotonin receptors, adrenergic receptors, adrenoceptors receptors, dopamine receptors, sigma receptors, emopamil binding proteins, calcium channel receptors, or any subtype or subclass thereof.

65. (Original) The method of claim 63, wherein the neuroreceptor(s) are selected from 5HT_{1A}, σ_1 , σ_2 , α_1 , Ca²⁺ channel receptors, EBP or a combination thereof.

66. - 68. (Cancelled)

69. (Original) A compound capable of binding a metal ion, the compound according to the formula:



wherein

X is a linking group comprising a backbone chain having 1 to about 8 atoms, the backbone chain can optionally include ester, amide, ether or thioether linkages in the backbone chain; and

R₁ and R₂ each are independently selected unsubstituted alkyl groups having from 1 to about 8 carbon atoms, alkoxyalkyl group having from 2 to about 8 carbon atoms, and substituted alkyl or alkoxyalkyl groups having from 1 to about 8 carbon atoms which are substituted with one or more groups selected from optionally substituted aryl, optionally substituted cycloalkyl, optionally substituted heteroalicyclic, and optionally substituted heteroaryl, wherein at least one of R₁ or R₂ is a substituted alkyl or alkyloxy group;

R is selected from hydrogen, C(O)O(R₃), or C(O)NH(R₃); and

E represents an oxo group or two hydrogen atoms.